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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/613,897	07/02/2003	Robert W. Boesel	COM0201 #3 (038.0449)	9534
50996 7590 05/27/2009 INGRASSIA FISHER & LORENZ, P.C. (FS) 7010 E. COCHISE ROAD SCOTTSDALE, AZ 85253			EXAMINER YU, HENRY W	
			ART UNIT 2182	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/613,897	Applicant(s) BOESEL ET AL.	
	Examiner HENRY YU	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/30/2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/30/2009, 04/15/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

INFORMATION CONCERNING RESPONSES

Response to Amendment

1. This Office Action is in response to applicant's communication filed March 30, 2009, in response to PTO Office Action mailed on February 11, 2009. The Applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.
2. In response to the last Office Action, **claims 1, 7, 9, 10, 13, 17-18, and 22** have been amended. **Claims 5 and 16** have been cancelled. As a result, **claims 1-4, 6-15, and 17-22** are now pending in this application.
3. The objections to the drawings have been withdrawn due to the amendment filed March 30, 2009.

Response to Arguments

4. Applicant's arguments filed on March 30, 2009, in response to PTO Office Action mailed February 11, 2009, have been fully considered. The arguments pertaining to the idea of a system that disables a processing component upon the completion of a task or process are persuasive. Hence, the rejection has been withdrawn. However, upon further review a new ground of rejection has been made in view of Tamura (Patent Number US 6,108,693).

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-4, 6-7, 9-15, 17, and 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram et al. (Publication Number US 2002/0176489 A1) in view of Tamura (Patent Number US 6,108,693).

As per **claim 1**, Sriram et al. discloses "*a method of processing digital communication signals in a system including a processor and a plurality of buffers, the method comprising: buffering first digital samples corresponding to a first group of symbols into a first buffer and a second buffer (two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. PNi points to Chip i and PNi+1 points to Chip i+1); Figure 1), wherein buffered first digital samples corresponding to earlier paths of the first group of symbols are stored in the first buffer, and buffered first digital samples corresponding to later paths of the first group of symbols are stored in the second buffer (one of the two buffers of the triple data input buffer contains a plurality of early sets of chips while the remaining buffer contains a plurality of temporally late sets of chips (Page 1, paragraph 0009). As can be seen from Figure 1, the buffers are in sequential order).*"

Sriram et al. discloses "processing, by the processor (**through a correlator datapath; Page 1, paragraph 0011**), the first digital samples in the first buffer and the second buffer for all known paths of the first group of symbols during a first symbol group duration (**despreading a plurality of triple data input buffer chips selected from the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011**)."

Sriram et al. discloses "simultaneously with processing the first digital samples, buffering second digital samples corresponding to a second group of symbols into the second buffer and a third buffer (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**), wherein buffered second digital samples corresponding to earlier paths of the second group of symbols are stored in the second buffer, and buffered second digital samples corresponding to later paths of the second group of symbols are stored in the third buffer (**one of the two buffers of the triple data input buffer contains a plurality of early sets of chips while the remaining buffer contains a plurality of temporally late sets of chips (Page 1, paragraph 0009). As can be seen from Figure 1, the buffers are in sequential order**)."

Sriram et al. discloses "processing, by the processor (**through a correlator datapath; Page 1, paragraph 0011**), the second digital samples in the second buffer and the third buffer for all known paths of the second group of symbols during a second symbol group duration (**despreading a plurality of triple data input buffer chips**

selected form the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011)."

Sriram et al. discloses "simultaneously with processing the second digital samples, buffering third digital samples corresponding to a third group of symbols into the third buffer and the first buffer (***two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009***), wherein buffered third digital samples corresponding to earlier paths of the third group of symbols are stored in the third buffer, and buffered third digital samples corresponding to later paths of the third group of symbols are stored in the first buffer (***one of the two buffers of the triple data input buffer contains a plurality of early sets of chips while the remaining buffer contains a plurality of temporally late sets of chips (Page 1, paragraph 0009). As can be seen from Figure 1, the buffers are in sequential order***)."

Sriram et al. discloses "processing the third digital samples in the third buffer and the first buffer for all known paths of the third group of symbols during a third symbol group duration (***despreading a plurality of triple data input buffer chips selected form the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011***)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations *disabling the processor upon completion of processing the first digital samples (there exists a status flag for*

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controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed) through a remainder of the first symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group),"
"disabling the processor upon completion of processing the second digital samples (Column 2, lines 56-67) through a remainder of the second symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)," and
"disabling the processor upon completion of processing the third digital samples (Column 2, lines 56-67) through a remainder of the third symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)."

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of idea of processor/component disabling upon the completion of a task or process as disclosed

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by Tamura, which notes instances of data being inaccessible if a particular process is still active [**Column 1, lines 51-58**]. Hence, it would be obvious for one skilled in the art to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 2**, the combination of Sriram et al. and Tamura discloses “*the method*” (see rejection to **claim 1** above). Sriram et al. further discloses “*the plurality of buffers hold a number of digital samples (**despread symbols dumped into a finger symbol buffer**), the number being adjusted for communication conditions (**number of despread symbols dumped into a finger symbol buffer depends on the value of SF (symbol fingers); Page 3, paragraph 0041**).*”

As per **claim 3**, the combination of Sriram et al. and Tamura discloses “*the method*” (see rejection to **claim 1** above). Sriram et al. further discloses “*the communication conditions include a communication technology (**system/method capable of supporting spread-spectrum CDMA; Page 4, paragraph 0048**) and anticipated maximum useful multi-path delay in an environment (**system/method is capable of handling special cases of early/ontime/late correlations that occur when the on-time sample is near a chip boundary; Page 4, paragraph 0044; FIG. 4a-4c**).*”

As per **claim 4**, the combination of Sriram et al. and Tamura discloses “*the method*” (see rejection to **claim 1** above). Sriram et al. further discloses “*received information relevant to a given group of transmitted symbols (**input buffer chips**) is processed in one iteration, without a need to store intermediate results for the given*

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*group of transmitted symbols (**despreading a plurality of triple data input buffer chips by the correlator datapath in a single processing cycle; Page 1, paragraph 0011).***"

As per **claim 6**, the combination of Sriram et al. and Tamura discloses "*the method*" (see rejection to **claim 1** above). Sriram et al. further discloses "*tuning a receiver to a first channel, storing received symbols from the first channel (**receiving chip samples into the triple data input buffer (Page 1, paragraph 0010) with an input buffer associated with time tracking of a particular symbol multipath; Page 1, paragraph 0007**), and tuning the receiver to a second channel (**timing change associated with the chip samples, indicating that samples at another timing value has been inputted beforehand; Page 1, paragraph 0012).***"

As per **claim 7**, the combination of Sriram et al. and Tamura discloses "*the method*" (see rejection to **claim 1** above). Sriram et al. further discloses "*processing symbols received from the first channel during extra cycles of processing while the receiver is tuned to the second channel (**in special cases when a timing change request has arrived, one extra cycle is idled to adjust for the time change before the system resumes normal operation (Page 1, paragraph 0007; Page 3, paragraph 0041).** Furthermore, two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being writtten into by incoming chips (Page 1, paragraph 0009), indicating receiver focus elsewhere during the processing of the first set of symbols).*"

As per **claim 9**, Sriram et al. discloses "a method of processing digital communication signals in a system including a plurality of buffers, the method comprising: processing, by a processor (**through a correlator datapath; Page 1, paragraph 0011**) during a first symbol group duration (**despreading a plurality of triple data input buffer chips selected from the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011**), symbols corresponding to a first group of symbols to be processed and from all known paths (**time tracking that allows demodulation of a particular multipath at a particular timing condition; Page 2, paragraph 0026**), wherein the first group of symbols in a first path start in a first buffer and end in a second buffer (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1**), and receiving samples at a third buffer while the first group of symbols is being processed (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**)."

Sriram et al. discloses "processing, by the processor during a second symbol group duration, symbols corresponding to a second group of symbols to be processed and from all known paths, wherein the second group of symbols in a second path start in the second buffer and end in the third buffer (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip**

i+1); **Figure 1**), and receiving samples at the first buffer while the second group of symbols is being processed (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**)."

Sriram et al. discloses "processing, by the processor (**through a correlator datapath; Page 1, paragraph 0011**) during a third symbol group duration, symbols corresponding to a third group of symbols to be processed and from all known paths, wherein the third group of symbols in a third path start in the third buffer and end in the first buffer (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1**), and receiving samples at the second buffer while the third group of symbols is being processed (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**)."

Sriram et al. discloses "adapting duration time of the processing of the first, second, and third groups based on channel and signal conditions (**number of despread symbols dumped into a finger symbol buffer depends on the value of SF (symbol fingers); Page 3, paragraph 0041**)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations "disabling the processor upon completion of processing the symbols corresponding to the first group (**there**

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exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed) through a remainder of the first symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)," "disabling the processor upon completion of processing the symbols corresponding to the second group (Column 2, lines 56-67) through a remainder of the second symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)," and "disabling the processor upon completion of processing the symbols corresponding to the third group (Column 2, lines 56-67) through a remainder of the third symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)."

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of idea of

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processor/component disabling upon the completion of a task or process as disclosed by Tamura, which notes instances of data being inaccessible if a particular process is still active [**Column 1, lines 51-58**]. Hence, it would be obvious for one skilled in the art to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 10**, Sriram et al. discloses "*an apparatus to process digital communication signals, the apparatus comprising: a plurality of buffers (**triple data buffer; Page 1, paragraph 0009**), "a processing unit (**correlator coprocessor; Figure 7**), "programmed memory having instructions (**configuration tables; Figure 7**) directing the processing unit (**correlator coprocessor through a controller**) to process first digital samples corresponding to a group of symbols to be processed in a plurality of buffers, the first digital samples starting in a first buffer of the plurality of buffers and ending in a second buffer of the plurality of buffers (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1**), "and "wherein the processing unit processes the first digital samples during a first symbol group duration (**despreading a plurality of triple data input buffer chips selected from the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011**), and wherein additional digital samples are received at a third buffer of the plurality of buffers while the first digital samples are being processed (**two of the three buffers are***

available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations "*wherein the processing unit is disabled upon completion of processing the first digital samples (there exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed) through a remainder of the first symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group).*"

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of processor/component disabling upon the completion of a task or process as disclosed by Tamura, which notes instances of data being inaccessible if a particular process is still active [**Column 1, lines 51-58**]. Hence, it would be obvious for one skilled in the art

to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 11**, the combination of Sriram et al. and Tamura discloses "*the apparatus*" (see rejection to **claim 10** above). Sriram et al. further discloses "*comprising input and output busses (**data path; Figure 7**) operable to permit random access to the plurality of buffers during processing (**demodulation even when the mulipath is not constant; Page 2, paragraph 0026**).*"

As per **claim 12**, the combination of Sriram et al. and Tamura discloses "*the apparatus*" (see rejection to **claim 10** above). Sriram et al. further discloses "*symbols are processed in a different group of buffers after a process iteration is complete (**at each iteration, the buffer is shifted over by 16 chips; Figure 1**).*"

As per **claim 13**, Sriram et al. discloses "*a method of processing digital communication signals, the method comprising: receiving a communication signal at a receiver (**date from Rx source into input buffers; Figure 7**),*" "*communicating digital samples from the received communication signal to sample buffers (**signals from Rx source 0 and 1 to input buffers; Figure 7**), wherein the digital samples include symbols (**symbol despreding; Page 2, paragraph 0033**).*"

Sriram et al. discloses "*processing, by a processor during a first symbol group duration, the symbols in a first group of sample buffers (**two of the three buffers, consisting of one group, are processed by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. PN_i points to Chip *i* and PN_i+1 points to Chip *i*+1); Figure 1**) and receiving digital samples from the*

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receiver at a second group of sample buffers during the processing (remaining buffer, for the second group, is being written into by incoming chips; Page 1, paragraph 0009)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations "*disabling the processor upon completion of processing the symbols in the first group of sample buffers (there exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed)* through a remainder of the symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)" and "*enabling the processor to process the symbols in the second group of sample buffers during a second symbol group duration (there exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled; Column 2, lines 56-67)."*

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of idea of processor/component disabling upon the completion of a task or process as disclosed by Tamura, which notes instances of data being inaccessible if a particular process is still active [**Column 1, lines 51-58**]. Hence, it would be obvious for one skilled in the art to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 14**, the combination of Sriram et al. and Tamura discloses “*the method apparatus*” (see rejection to **claim 13** above). Sriram et al. further discloses “*after symbols in a symbol path are completely processed, designating sample buffers in the first group of sample buffers as being in the second group of sample buffers (after the first iteration, there is a shift to the right of 16 chips, where the second group of 16 chips become part of the group of buffers accessible for processing in the next iteration $k+1$; Figure 1).*” Sriram et al. discloses “*designating sample buffers in the second group of sample buffers as being in the first group of sample buffers, whereby sample buffers are rotated between processing iterations and digital sample receiving operations (the buffer is circular (Page 1, paragraph 0007) and at each iteration the buffer ‘slides’ by an interval of 16 chips (each buffer consists of 16 chips) in a circular manner; Page 3, paragraph 0040; Figure 2).*”

As per **claim 15**, the combination of Sriram et al. and Tamura discloses "*the method*" (see rejection to **claim 13** above). Sriram et al. further discloses "sample buffers in the first group of sample buffers designated as being in the second group of sample buffers include all the sample buffers in the first group of sample buffers (**after the first iteration, there is a shift to the right of 16 chips, where the second group of 16 chips become part of the group of buffers accessible for processing in the next iteration $k+1$; Figure 1**) except a sample buffer having an end of a symbol path (**at iteration $k+1$, buffers from the first iteration k that include the notation 'x' for 'on-time sample being used for despread' are not included; Figure 1**)."

As per **claim 17**, Sriram et al. discloses "a method of processing digital communication signals in a system including a processor and a plurality of buffers, the method comprising: processing, by the processor during a first symbol group duration, symbols corresponding to a first group of symbols to be processed and starting in a first buffer and ending in a second buffer (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1**), and receiving samples at a third buffer only during the processing of the first group of symbols (**remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**)" where the buffer is circular (**Page 1, paragraph 0007**) and at each iteration the buffer "slides" by an interval of 16 chips (with each buffer consisting of 16 chips) in a circular manner to enable the datapath to have access to another buffer (**Page 3, paragraph 0040; Figure 2**). Since the triple buffer of the

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system/method is circular, Sriram et al. also discloses "processing, by the processor during a second symbol group duration, symbols corresponding to a second group of symbols to be processed and starting in the second buffer and ending in the third buffer **(two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1)**, and receiving samples at the first buffer while the second group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009)"** and "processing, by the processor during a third symbol group duration, symbols corresponding to a third group of symbols to be processed and starting in the third buffer and ending in the first buffer **(two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1)**, and receiving samples at the second buffer while the third group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009)."**

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations "disabling the processor upon completion of processing the symbols corresponding to the first group **(there exists a status flag for controlling write and read enable/disable of the**

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communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled; Column 2, lines 56-67) during a remainder of the first symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)," "disabling the processor upon completion of processing the symbols corresponding to the second group (Column 2, lines 56-67) during a remainder of the second symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)," and "disabling the processor upon completion of processing the symbols corresponding to the third group (Column 2, lines 56-67) during a remainder of the third symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)."

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of idea of processor/component disabling upon the completion of a task or process as disclosed by Tamura, which notes instances of data being inaccessible if a particular process is still active [Column 1, lines 51-58]. Hence, it would be obvious for one skilled in the art

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to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 22**, Sriram et al. discloses "*an apparatus to process digital communication signals, the apparatus comprising: a plurality of buffers (**triple data buffer; Page 1, paragraph 0009**), "a processing unit (**correlator coprocessor; Figure 7**), "programmed memory having instructions (**configuration tables; Figure 7**) directing the processing unit (**correlator coprocessor through a controller**) to process first digital samples corresponding to a group of symbols to be processed in a plurality of buffers, the first digital samples starting in a first buffer of the plurality of buffers and ending in a second buffer of the plurality of buffers (**two of the three buffers are available for processing by a correlator datapath (Page 1, paragraph 0009), with sections pointing to specific portions (e.g. P_{Ni} points to Chip i and P_{Ni+1} points to Chip $i+1$); Figure 1**), "wherein the processing unit (**through a correlator datapath**) processes the first digital samples during a first symbol group duration (**despreading a plurality of triple data input buffer chips selected from the two buffers available for processing in a single correlation processing cycle; Page 1, paragraph 0011**), and wherein additional digital samples are received at a third buffer of the plurality of buffers while the first digital samples are being processed (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**), and wherein the processing unit is operable to select digital samples or an intermediate result from a buffer coupled to the processing unit (**despreading a***

plurality of triple data input buffer chips selected from two buffers available for processing; Page 1, paragraph 0011)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations *"wherein the processing unit is disabled upon completion of processing the first digital samples (there exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed) through a remainder of the first symbol group duration (the wording of this limitation indicates that disabling occurs after completion as a result of processing during the remainder duration of the symbol group)."*

Sriram et al. and Tamura are analogous art in that they are from the same field of communication systems, particularly with data sampling.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine the elements of Sriram et al. with the idea of idea of processor/component disabling upon the completion of a task or process as disclosed by Tamura, which notes instances of data being inaccessible if a particular process is still active [Column 1, lines 51-58]. Hence, it would be obvious for one skilled in the art

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to disable a processor once a task has been completed in order to allow further processing to occur.

7. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram et al. (Publication Number US 2002/0176489 A1) and Tamura (Patent Number US 6,108,693) in view of Lee et al. (Patent Number US 6,650,140 B2).

As per **claim 5**, the combination of Sriram et al. and Tamura discloses “*the method*” (see rejection to **claim 1** above). Though Sriam et al. discloses “*process received symbols in the plurality of buffers (**despreading a plurality of triple data input buffer chips selected from two buffers; Page 1, paragraph 0011**)*,” the combination of Sriram et al. and Tamura does not disclose “*turning off a receiver subsystem and continuing to process received symbols in the plurality of buffers.*”

Lee et al. discloses “*turning off a receiver subsystem and continuing to process received symbols in the plurality of buffers (**receiver can be turned off if it is not needed; Column 15, lines 40-44**)*.”

Sriram et al., Tamura, and Lee et al. are analogous art in that they are from the same field of communication systems and interfacing.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the method as disclosed by the combination of Sriram et al. and Tamura with the idea of the turning off the receiver as disclosed by Lee et al., which Lee et al. notes is related to a power-down mode (**Column 15, lines 40-41**). The ability to power down any unused components can allow a device to save power, especially in mobile devices that run off a battery with a finite amount of power.

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8. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram et al. (Publication Number US 2002/0176489 A1) and Tamura (Patent Number US 6,108,693) in view of Kim et al. (Patent Number US 6,714,527 B2).

As per **claim 8**, the combination of Sriram et al. and Tamura discloses “*the method*” (see rejection to **claim 1** above). However, the combination of Sriram et al. and Tamura does not explicitly disclose “*the first, second, and third paths have different sampling rates.*”

Kim et al. discloses “*a first, second, and third paths have different sampling rates (a plurality of communication signals have differing spreading codes; Abstract, lines 1-2).*”

Sriram et al., Tamura, and Kim et al. are analogous art in that they are from the same field of communication systems.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the method as disclosed by the combination of Sriram et al. and Tamura with the idea of the paths have different sampling rates as disclosed by Kim et al.

Kim et al. notes that using a plurality of spreading codes, with each code pertaining to a particular user, would allow a signal from a particular user relating to a particular spreading code to be enhanced while the signals for other users are not enhanced (**Column 1, lines 60-65**). This is particularly useful in multiple access digital communication systems, where a plurality of users can access the same

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communication medium to transmit or receive data (**Column 1, lines 15-21**), with such systems being useful within communication media with limited bandwidth.

9. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram et al. (Publication Number US 2002/0176489 A1) in view of Roohparvar (Patent Number US 6,615,307 B1).

As per **claim 16**, Sriram et al. discloses “*the method*” (see rejection to **claim 13** above). However, Sriram et al. does not disclose “*shutting down sample buffers when sufficient processing is complete.*”

Roohparvar “*shutting down sample buffers (input buffers) when sufficient processing is complete (during power-down modes, which shows that there are no further processes to handle; Column 5, lines 6-8).*”

Sriram et al. and Roohparvar are analogous art in that they are from the same field of interface buffering.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the method of processing digital communication signals in a system including a plurality of buffers as disclosed by Sriram et al. with the idea of the turning off the buffers as disclosed by Roohparvar, which Roohparvar notes is related to providing low standby power (**Column 5, lines 6-8**). The ability to power down any unused components can allow a device to save power, especially in mobile devices that run off a battery with a finite amount of power.

10. **Claims 18-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sriram et al. (Publication Number US 2002/0176489 A1) in view of Tamura (Patent

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Number US 6,108,693) and in further view of Robertson et al. (Publication Number US 2001/0038633 A1).

As per **claim 18**, Sriram et al. discloses "a method of processing digital communication signals in a system including a processor and a plurality of buffers, the method comprising: processing, by the processor during a first symbol group duration, from all known paths of a first group of symbols (**time tracking that allows demodulation of a particular multipath at a particular timing condition; Page 2, paragraph 0026**), wherein buffered digital samples corresponding to the first group of symbols start in a first buffer and end in a third buffer (**two of the three buffers are available for processing by a correlator datapath while the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**), and receiving samples at a fourth buffer and a fifth buffer while the first group of symbols is being processed (**two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009**)," where the buffer is circular (**Page 1, paragraph 0007**) and at each iteration the buffer "slides" by an interval of 16 chips (with each buffer consisting of 16 chips) in a circular manner to enable the datapath to have access to another buffer (**Page 3, paragraph 0040; Figure 2**).

Sriram et al. also discloses the idea of processing from one set of buffers while writing into another set of buffers as disclosed in "receiving samples at the first buffer and second buffer while the second group of symbols is being processed (**two of the three buffers are available for processing by a correlator datapath while**

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(emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009), "receiving samples at the fourth buffer and the third buffer while the third group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009),** "receiving samples at a second buffer and the fifth buffer while the fourth group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009),** "receiving samples at the fourth buffer and the first buffer while the fifth group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009),** and "receiving samples at the second buffer and the first buffer while the sixth group of symbols is being processed **(two of the three buffers are available for processing by a correlator datapath while (emphasis) the remaining buffer is being written into by incoming chips; Page 1, paragraph 0009).**"

Concerning the use of five buffers, Robertson et al. discloses "processing, by the processor during a second symbol group duration, from all known paths of a second group of symbols, wherein buffered digital samples corresponding to the second group of symbols start in the third buffer and end in the fifth buffer **(several of the buffers are available for processing by a correlator datapath and remaining buffer is written into by incoming chips; Page 1, paragraph 0009),** "processing, by the processor

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during a third symbol group duration, from all known paths of a third group of symbols, wherein buffered digital samples corresponding to the third group of symbols start in the fifth buffer and end in the first buffer (**several of the buffers are available for processing by a correlator datapath and remaining buffer is written into by incoming chips; Page 1, paragraph 0009**)," "processing, by the processor during a fourth symbol group duration, from all known paths of a fourth group of symbols, wherein buffered digital samples corresponding to the fourth group of symbols start in the first buffer and end in the third buffer (**several of the buffers are available for processing by a correlator datapath and remaining buffer is written into by incoming chips; Page 1, paragraph 0009**)," "processing, by the processor during a fifth symbol group duration, from all known paths of a fifth group of symbols, wherein buffered digital samples corresponding to the fifth group of symbols start in the third buffer and end in the fifth buffer (**several of the buffers are available for processing by a correlator datapath and remaining buffer is written into by incoming chips; Page 1, paragraph 0009**)," and "processing, by the processor during a sixth symbol group duration, from all known paths of a sixth group of symbols, wherein buffered digital samples corresponding to the sixth group of symbols start in the fifth buffer and end in the first buffer (**several of the buffers are available for processing by a correlator datapath and remaining buffer is written into by incoming chips; Page 1, paragraph 0009**)."

Tamura discloses the idea of processor/component disabling upon the completion of a task or process, as disclosed in the limitations "disabling the processor

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upon completion of processing the first group of symbols during a remainder of the first symbol group duration (there exists a status flag for controlling write and read enable/disable of the communication buffer, where the initial state of the status flag is write-enabled and read-disabled. It is noted that upon write completion the status flag is set from read-disabled to read-enabled, and upon read completion the status flag is set from write-disabled to write-enabled (Column 2, lines 56-67). This is interpreted as write being disabled by a write completion notification, with the write processing not set to enabled until the read process is completed),"

"disabling the processor upon completion of processing the second group of symbols during a remainder of the second symbol group duration (Column 2, lines 56-67),"

"disabling the processor upon completion of processing the third group of symbols during a remainder of the third symbol group duration (Column 2, lines 56-67),"

"disabling the processor upon completion of processing the fourth group of symbols during a remainder of the fourth symbol group duration (Column 2, lines 56-67),"

"disabling the processor upon completion of processing the fifth group of symbols during a remainder of the fifth symbol group duration (Column 2, lines 56-67)," and "disabling the processor upon completion of processing the sixth group of symbols during a remainder of the sixth symbol group duration (Column 2, lines 56-67)."

Sriram et al., et al., Tamura, and Robertson et al. are analogous art in that they focus on the problem of buffering within a communication system.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify the method of processing digital communication signals in a

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system including a plurality of buffers as disclosed by Sriram et al. with the idea of the using a five-entry buffer as disclosed by Robertson et al., which notes that it is prudent to include at least one more additional entry in several cases, notably where the receive clock is faster than the transmit clock and to account for maximum phase skew that may be present between transmit and receive clocks (**Page 9, paragraph 0077**). Having five entries as opposed to three entries in a buffer not only can better account for the rate discrepancy between the system's receiver and a separate system's transmitter, but also can allow for more data to be stored before processing.

As for the idea of idea of processor/component disabling upon the completion of a task or process, Tamura notes instances of data being inaccessible if a particular process is still active [**Column 1, lines 51-58**]. Hence, it would be obvious for one skilled in the art to disable a processor once a task has been completed in order to allow further processing to occur.

As per **claim 19**, the combination of Sriram et al., Tamura, and Robertson et al. discloses *"the method"* (see rejection to **claim 18** above). Sriram et al. further discloses *"each of the plurality of buffers holds a different number of digital samples (**despread symbols dumped into a finger symbol buffer**) based on communication conditions (number of despread symbols dumped into a finger symbol buffer depends on the value of SF (symbol fingers); Page 3, paragraph 0041)."*

As per **claim 20**, the combination of Sriram et al., Tamura, and Robertson et al. discloses *"the method"* (see rejection to **claim 18** above). Sriram et al. further discloses *"the communication conditions include multi-path delays (**system/method is capable***

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of handling special cases of early/ontime/late correlations that occur when the on-time sample is near a chip boundary; Page 4, paragraph 0044; Figure 4a-4c) and waveform features (data portions are associated with time tracking of a particular symbol multipath; Page 2, paragraph 0033)."

As per **claim 21**, the combination of Sriram et al., Tamura, and Robertson et al. discloses "the method" (see rejection to **claim 18** above). Sriram et al. further discloses "the paths are from a plurality of base stations (***the system is capable of performing CDMA base station operations (Page 4, paragraph 0048) in a multipath environment that may not be constant; Page 2, paragraph 0026***)."

ACKNOWLEDGEMENT OF REFERENCES CITED BY APPLICANT

11. As required by **M.P.E.P. 609(c)**, the applicant's submission of the Information Disclosure Statement dated March 30, 2009, and April 15, 2009, is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by **M.P.E.P 609 C(2)**, a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

CONCLUDING REMARKS

Conclusions

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HENRY YU whose telephone number is (571)272-9779. The examiner can normally be reached on Monday to Friday, 8:00 AM to 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, TARIQ HAFIZ can be reached on (571) 272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. Y./
Examiner, Art Unit 2182

/Tammara Peyton/
Primary Examiner, 2182
May 19, 2009